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## MALARIAL FEVER IN NARCOTIC ADDICTS: ITS POSSIBLE TRANSMISSION BY THE HYPODERMIC SYRINGE

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An unusual prevalence of malarial fever in the narcotic addicts who were patients at the United States marine hospital at New Orleans was noted during the winter 1932-33. The reason for the special predilection of malaria for narcotic addicts was not known at that time, but the possible relationship of the intravenous administration of the "drug" to the disease was commented upon.

During the fiscal year ended June 30, 1933, 17 narcotic addicts were treated in this hospital. Five of them had acute cases of malaria, the diagnosis being confirmed by the finding of the plasmodia in the blood smears. This meant that 29.4 percent of the narcotic addicts seeking treatment had active malaria. During the same period there were 25 cases of malaria among 4,880 other admissions, an incidence of, roughly, one half of 1 percent. This difference was so striking that it suggested a special epidemiology for malaria in addicts. In an unpublished note to the Surgeon General of the Public Health Service, dated March 14, 1932, Dr. J. C. Geiger (1) mentioned the probable transmission of malarial infection from one addict to another by means of the hypodermic syringe. In a recent issue of the *Journal of the American Medical Association*, Dr. Oliver C. Nickum (2) reported a similar occurrence in Omaha, Nebr. Such an explanation would account for the unusual prevalence of unseasonable malaria in the narcotic addicts at the New Orleans Marine Hospital. In order to test this solution of the problem, our narcotic addict patients were confidentially interviewed.

During the late fall and early winter there had occurred in New Orleans an unusual number of deaths among drug addicts. This was a fact well known to all the addicts questioned, who had known several or all of the victims personally. The deaths had all occurred within a few weeks of each other; and, since two of them were peddlers, it seemed unreasonable to blame the "drug" for these

fatalities. Each of the drug addicts questioned was extremely interested and eager to help in every way to throw light upon this mystery. It was in this way that a confession of many of the practices of the narcotic-drug habitue were obtained from them. Only the pertinent facts incriminating the hypodermic syringe will be given here.

Most heroin and morphine addicts prefer to take their drug intravenously; they claim to obtain a greater "kick" taking it by this route. The drug is often purchased from peddlers in gelatin capsules, in which it is mixed with sugar of milk.

The hypodermic apparatus in common use in New Orleans consists of a medicine dropper to which a hypodermic needle is attached. To make the connection watertight, a cigarette paper is wrapped around the pipette of the medicine dropper. The drug is dissolved in water in a spoon, the top of a tobacco can, an oyster shell, or any other convenient container. The solution is generally boiled and then sucked into the medicine dropper, when it is ready for use.

When two or more addicts are together, it is usual for them to use a common hypodermic outfit of the kind described above. It is generally not cleaned between "shots." Sometimes the dosage of the drug for two or more addicts is prepared in one solution and the medicine dropper passed from one to the other for the injection of their respective shares. The price of the drug is often difficult to obtain, and sometimes three addicts will chip in together to buy two capsules. The method of division of the drug solution in one medicine dropper is then most convenient and is the one generally used under these circumstances.

The proof of the needle's entering the recipient's vein is the sight of blood in the pipette of the medicine dropper. Thus secondary users of the "outfit" are generally contaminated with the blood of the primary users. It is a known fact that minute quantities of malarial blood are sufficient for the transmission of the disease by intravenous injection.

At a local jail, on one occasion four drug addicts were caught in the act of preparing for the administration of the "drug" intravenously. Only one medicine dropper and hypodermic needle and several heroin capsules were found among them. At the New Orleans Marine Hospital such an outfit and a drug capsule were taken from one of the addict patients.

#### CASE I

T. G., white male, age 40, a native of Louisiana, was admitted to the marine hospital on October 10, 1932, with the complaint of chills and fever of a few days' duration. He admitted taking "dope" (heroin and morphine) intravenously since 1921. He had had malaria several years previously.

Physical examination showed an acutely ill patient with a temperature of 39.8° C. and pulse of 108. The veins of both forearms were blue and fibrosed. Breathing was of the asthmatic type, accompanied by numerous musical râles. The spleen was easily palpable and tender. Examination of the blood showed estivo-autumnal rings. The laboratory examinations were otherwise negative. The clinical course proved the case to be one of pernicious malaria necessitating intravenous quinine on account of the patient's critical condition and excessive vomiting. The disease was very resistant to quinine and there were two relapses during quinine therapy before recovery.

The source of the malaria in this patient was questioned at the time, since he had not been out of the city during the possible incubation period of the disease. He had been confined to a local prison. A recurrent malaria seemed doubtful because of its acuteness and severity. At the time the possible connection between malaria and the drug habit was not suspected in this case.

#### CASE II

R. M. Mc., white male, age 39, a merchant seaman, was readmitted on November 28, 1932, complaining of extreme weakness and fever. His sickness began 4 days before, with chills and fever. The patient stated that he had been a "dope addict" since 1920. Three years previously he had discontinued taking narcotics, but in the preceding month he had started again and had been using heroin intravenously ever since.

Examination showed an acutely ill patient with temperature of 39.4° C. and pulse of 100. Both forearms presented blue sclerotic veins. Blood smears showed estivo-autumnal parasites. The patient's stuporous condition and difficulty in swallowing made intravenous quinine therapy necessary at first.

After the malaria had become quiescent, the patient developed a transverse myelitis, of toxic origin (possibly malarial), at about the level of the second lumbar vertebra. He became discouraged and was caught with a medicine dropper and heroin capsule which a fellow addict had given him. On January 27, 1933, he was discharged at his own request and against medical advice. He was still unable to walk without support.

This was another severe case of malaria which it is believed was contracted through the hypodermic needle. It must be noted that the patient began using narcotics again by vein about a month prior to the onset of his disease. He had been previously treated in this hospital from July 14 to October 25, 1932, for bronchial asthma and chronic arthritis of the sacroiliac joints, and was apparently not using heroin at that time. No history of previous malaria was obtained on either admission. It was in the interval between the two hospitalizations that the patient encountered a group of narcotic addicts and started to use heroin again. There is evidence to the effect that he remained in the city of New Orleans during this period. His case developed in the post-mosquito season. The patient is known to have taken narcotics intravenously in the company of other addicts. These are the reasons for believing that he developed his malaria through the intravenous hypodermic needle route.

## CASE III

R. H., white male, age 32, merchant seaman, living in New Orleans, was admitted on December 2, 1932, for treatment of drug addiction. It appeared that he had been in this city continuously for more than 1 month before this date. His past history was negative for malarial fever. His narcotic habit started through curiosity while in bad company in 1922. In 1925 he began using heroin intravenously and has used it regularly ever since except for a period of almost a year in 1929. During the preceding few months he had been taking about 4 grains daily. He wished to discontinue the drug habit and was willing to be placed in a strong room during treatment and to be kept off of "dope" entirely. There were no other complaints.

Examination showed a very poorly nourished individual who appeared older than the stated age. Height, 68 inches; weight, 114 pounds. He sat in a chair moaning and crying. His eyes had a starey look. The general appearance was that of weakness and emaciation rather than acute illness. The heart, lungs, and abdomen presented no abnormal findings, and the spleen was not palpable. The extremities were markedly emaciated, and all the muscles were weak and flabby. There was a coarse tremor of the extended fingers. Over the veins of both fore-arms were numerous bluish scars.

On the fourth hospital day the patient developed a fever which pursued an intermittent course with peaks up to 40° C. When this occurred he was taken out of isolation and transferred to the medical ward to facilitate his treatment. Blood smears showed estivo-autumnal parasites. Quinine therapy quickly checked the clinical course of the disease. He was discharged improved on December 23, 1932, with the advice to continue quinine in daily 10-grain doses for 2 months.

This patient developed malaria 4 days following admission. He had been using heroin intravenously for several weeks prior to hospitalization. It is known from different sources, and the patient admitted it himself, that he used the "drug" with other addicts, among whom were some of those who had since died of malaria (F. H., L. K., and P. R.). The incubation period was proper for malaria to have been injected intravenously with the heroin. All these addicts had malignant tertian (estivo-autumnal) malaria. It is believed that his malaria was not mosquito-borne, the season being against that possibility. On the other hand, all the evidence incriminates the "hypodermic syringe" in this case.

## CASE IV

A. S., white male, age 26, admitted December 13, 1932, for influenza, discharged December 17, 1932, and readmitted December 21, 1932, with the complaint of pains over the whole body.

Examination showed an acutely ill patient with a fever of 40° C. and no other pertinent physical findings except scarred and sclerotic fore-arm veins. He admitted being a heroin user for a number of years. It was at first thought that he had a relapse of his influenza, and he was treated for this. Continuance of the fever and his previous association with another addict who had malaria (R. H.) indicated that blood examination was necessary. The blood smears showed estivo-autumnal plasmodia. Quinine therapy controlled the disease.

This patient had not been out of the city of New Orleans for several weeks before the onset of malaria. It was his first attack of malaria. Mosquito transmission seemed improbable on account of the season of the year. It is known that he had associated with a malarial addict recently. Both had the same type of parasites in their blood. R. H. confessed using the same hypodermic outfit with A. S. for the purpose of injecting heroin at the same sitting. He says that after having prepared a medicine dropper of "dope solution" he injected one third of the contents into one of his veins and passed it to A. S., who injected the balance into his vein. It is believed that this is the way in which A. S. contracted his malaria.

#### CASE V

J. G. H., white, male, age 28, seaman, whose home is New Orleans, entered the hospital on May 28, 1933, for treatment of chills and fever and swelling of face and feet. He stated that he had had chills and fever every third day for about a week. During the 2 preceding years he had been taking heroin or morphine intravenously. As long as he could get the drug he did not mind the chills and fever, but when his money gave out he came to the hospital for relief.

Examination showed an acutely ill patient with swollen face and ankles and a normal temperature. The heart and lungs were negative. The spleen was barely palpable upon deep inspiration. There were multiple bluish scars over the veins of both forearms near the elbows. Urinalysis showed albumin and casts, and the blood smear showed the quartan type of malarial plasmodia. Quinine therapy quickly cleared up the malaria and the urine became normal.

Upon questioning, this patient stated that he had not been away from the city of New Orleans for at least 6 weeks before the onset of his disease. It is very unlikely that he should have contracted mosquito-borne malaria, especially of the quartan type, in this city.

The patient further admitted taking heroin intravenously in the company of other narcotic addicts. A week or 10 days before developing his first chill he remembered injecting himself intravenously with the same medicine dropper hypodermic outfit which had just been used by another heroin addict (J. J.). He knew that some of J. J.'s blood entered the medicine dropper but he did not think that this would be harmful. J. J. is a seaman who had made numerous trips to the tropics and had recently come from Galveston. It is regretted that J. J. could not be examined, as he had left on his ship shortly after his association with J. G. H. In this case the transmission of malaria by the "hypodermic syringe" route is also feasible.

These five cases stimulated the writer to investigate the cause of deaths of the narcotic addicts who had so dramatically passed out of the picture in New Orleans in the late fall of 1932. Their names were freely given by the several addicts who had known them in life as follows: G. B., L. K., F. H., P. D., P. R., and T. M.

The death certificates were kindly furnished by the New Orleans Board of Health and the coroner's office. It was startling to find that

five of them had died of malaria, presumably of the pernicious estivo-autumnal type. It is probable that the other one also had died of malaria.

G. B., white male, age 38, seaman, had been treated at the marine hospital during the preceding fiscal year for pulmonary tuberculosis, tertiary syphilis, and drug addiction—heroin and morphine. He was discharged on June 28, 1932. After his discharge it was learned that he associated with a group of narcotic addicts and that he did not leave the city as had been his intention. It is known that during November 1932, he had used heroin intravenously in company with others. On the 19th of that month he had a severe chill and fever and was so shaky that he was unable to administer the heroin to himself. A friend (J. C. A.) prepared a medicine dropper of heroin solution sufficient for two and injected G. B. intravenously with half of the contents. Immediately thereafter he injected the remainder into his own vein. Three days later G. B. was admitted to Charity Hospital, New Orleans. He died there the following day of comatose malaria.

J. C. A., who had been a narcotic habitue for 15 years, was afterwards admitted to the marine hospital in New Orleans on January 29, 1933, for the treatment of an infected foot. Examination failed to show any signs of malaria, and his spleen was not enlarged. Repeated and concentrated blood examinations for malaria were negative. (This case is reported so as to be fair and present both sides of the question.) The conditions for the transmission of malaria by the "hypodermic syringe" were ideal in this instance and yet it did not materialize. Individual resistance to the disease may be the explanation.

P. D., white male, age 27, seaman, a native and resident of New Orleans and a former patient at this marine hospital, died on November 4, 1932, at Charity Hospital of malarial fever and narcotic addiction. Through other narcotic addicts it was learned that he had recently used heroin intravenously with G. B., F. H., R. H., and L. K., among others.

L. K., white male, age 27, laborer, resident of New Orleans, died of comatose malaria at Charity Hospital on November 15, 1932. It is known that he was a drug addict and a peddler. Shortly before his death he had used heroin intravenously with F. H., P. D. and others.

F. H., white male, age 27, seaman, resident of New Orleans, died of comatose malaria at Charity Hospital on November 17, 1932. He is known to have been a narcotic addict and a peddler. Some of the addicts and others who knew him during life testified that he had used heroin intravenously in company with others, G. B. and L. K. among them, up to the time of his death.

P. R., white male adult, resident of New Orleans, died at Charity Hospital, New Orleans, of comatose malaria and drug addiction on December 16, 1932. He was a heroin addict, using the drug intravenously, and is known to have associated with those who died before him as well as with other addicts.

T. M., white male adult, resident of New Orleans, died December 7, 1932, at the Federal jail in New Orleans, where he was known to be a narcotic addict, using the drug intravenously. He had been sick since November 17, 1932, with an irregular type of fever up to 39.2° C. and was thought to have influenza. Twenty-four hours before death he became comatosed. Spinal fluid survey was negative. Special examination of blood for malaria was not done. It is reported that he was associated and used heroin intravenously with most of the drug addicts who died of comatose malaria in New Orleans. This case can only be regarded as suspicious and it is regrettable that the blood was not examined for plasmodia.

It is learned that a similar outbreak of malaria among narcotic addicts occurred at Galveston. At least four cases were treated at John Sealy Hospital between February and May 1933. Three of these cases were of the quartan type. The other patient died and a diagnosis of malaria was made at post mortem. All of these patients were heroin addicts and showed evidence of using the drug intravenously.

#### SUMMARY AND CONCLUSIONS

1. Five cases of malarial fever in narcotic addict patients of the New Orleans Marine Hospital occurring during the fiscal year 1932-33 are briefly reviewed. Five deaths from malaria among the narcotic addict population of New Orleans are reported during the same period. A similar outbreak of malaria in narcotic drug addicts has occurred recently at Galveston.

2. Evidence of the transmission of malaria by the hypodermic syringe among these cases is submitted.

3. From the above-mentioned cases the malaria occurring among narcotic habitues seems to be of the pernicious type. This is perhaps a further argument incriminating the hypodermic syringe in malaria transmission.

4. It is realized that the number of cases reported are too few to permit definite conclusions, but the publication of information concerning them seems justifiable to stimulate further clinical observation along similar lines.

5. Mosquito-borne malaria is usually a rural disease. The malaria spreading among the addict population is likely to be of urban distribution, since the majority of addicts live in the larger cities.

6. It has been estimated that there is at least one narcotic drug addict to each thousand of the general population of the United States (3), and the danger of their spreading malaria in our southern cities as well as in cities farther north, where this disease is unknown, seems to be a real one.

7. If the hypodermic syringe must be accepted as a means of conveying malaria among narcotic addicts, then a new chapter in the epidemiology of this disease has been opened.

8. This should be an added incentive to the efforts of the Federal, State, and municipal health agencies in their fight for the enforcement of adequate narcotic suppressive measures.

#### REFERENCES

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- (3) Treadway, W. L.: Drug Addiction and Measures for Its Prevention in the United States. *Jour. Am. Med. Assoc.*, **99**: 372 (July 30, 1932).

## A FORM OF EXPERIMENTAL ENDOCARDITIS PRODUCED IN RABBITS

By O. F. HEDLEY, *Passed Assistant Surgeon*, and EDYTHE J. ROSE, *Associate Bacteriologist, United States Public Health Service*

Acute and subacute ulcerovegetative endocarditis not infrequently has been produced experimentally in animals. The work here reported is of interest because of the method used and because the lesions, although not differing from those reported by other observers, occurred entirely on the right side of the heart. In addition to the endocarditis, pericarditis and arthritis frequently occurred.

Reference is made to reviews of experimental endocarditis by Simons,<sup>1</sup> Bargaen,<sup>2</sup> Kinsella,<sup>3</sup> and workers in the Pickett-Thomson laboratory.<sup>4</sup> Acute and subacute endocarditis has been produced with streptococci, staphylococci, and pneumococci, obtained either from human cases of endocarditis or rheumatic fever or from the normal flora. Rosenow<sup>5</sup> noted the tendency for the lesions to localize on either the right or left side of the heart. In 1916 Detweiler and Robinson<sup>6</sup> reported lesions in the right side of the heart, similar to those described in this article, produced by injecting *Streptococcus viridans* cultures intravenously into rabbits.

The streptococci and extracts of cardiac tissues were obtained through the courtesy of Dr. Wallace M. Yater from a patient at the Georgetown University Hospital, Washington, D.C. The case was that of a rheumatic adhesive pericarditis with a terminal streptococcus septicemia. The etiologic factor of rheumatism being unknown, it is not possible to state the relationship of the septicemia to the original infection. Alpha prime streptococci were isolated by blood culture during life and from cultures of the heart blood and pericardial fluid at necropsy. The report of this case by Yater and Hedley will shortly appear in the literature.

### EXPERIMENTAL DATA

The results of the experiments on rabbits are displayed graphically in the accompanying chart.

One monkey was injected intravenously with 20 cc of the patient's whole blood. There resulted no evidence of rheumatism or heart disease. Necropsy at the end of seven weeks was negative.

Three monkeys were injected intravenously with 10 cc of the original cultures of alpha prime streptococci obtained from the

<sup>1</sup> Quart. J. Med., 7: 291 (1914).

<sup>2</sup> Arch. Int. Med., 32: 727 (1923).

<sup>3</sup> Ibid., 19: 367 (1917).

<sup>4</sup> Annals of the Pickett-Thomson Research Laboratory, vol. IV, 1928-29.

<sup>5</sup> J. Infec. Dis., 6: 245 (1902).

<sup>6</sup> Jour. Am. Med. Assoc., 67: 1653 (1916).

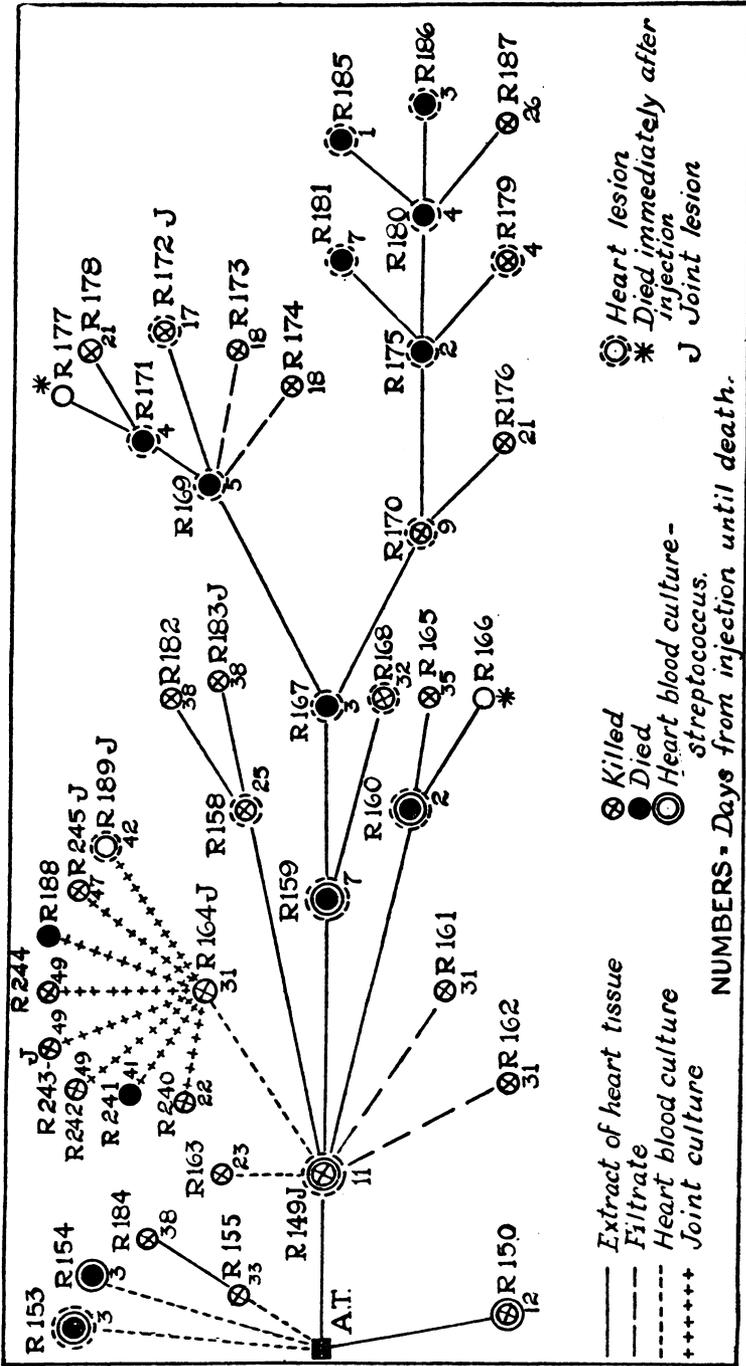


FIGURE 1.—Results in rabbits injected with cultures and tissue extract from A. T.

patient. One animal was moribund the next day, and at necropsy evidence of an overwhelming infection was noted. An acute splenitis was found, but there was no evidence of heart disease. The two other monkeys developed arthritis, tending first to migrate from joint to joint and subsequently to settle in a single joint—in one instance the left knee and in the other the right. The arthritis was accompanied by fever and generalized malaise. The conditions cleared up with little or no residual changes other than rarefaction of the bones, apparently due to disuse.

Three rabbits (R 153, R 154, R 155) were injected intravenously with original cultures of alpha prime streptococci obtained from the patient. One of the animals (R 153) which died three days later, at necropsy showed a whitish discoloration throughout the ventricular musculature, particularly near the apex. Microscopic examination revealed necrosis, cloudy swelling, and the presence of streptococci in the region of the necrosis. No giant cells were found. Alpha prime streptococci were found in the heart blood. The second animal (R 154) died in three days; and while alpha prime streptococci were obtained from the heart blood at necropsy, there was no evidence of heart disease. The third animal (R 155) was killed at the end of 33 days. There was no evidence of heart disease.

A portion of the myocardium and overlying epicardium from the patient was ground up in a sterile mortar, saline added, and the mixture passed through gauze. A monkey was intravenously injected with 15 cc of this extract. Two days later it became violently ill and was found dead the next morning. Necropsy revealed a pale, friable myocardium filled with whitish areas of necrosis. The valves and pericardium were negative. Microscopic examination showed irregular loss of striations in the muscle fibers, cloudy swelling, and necrosis. Abscesses were noted throughout the myocardium. Organisms were seen in the areas of necrosis. An occasional bacterial thrombus was seen in the capillary vessels. There was nothing to suggest rheumatic infection. Other organs showed evidence of massive infection. The heart blood showed alpha prime streptococci.

Two rabbits (R 149 and R 150) were injected with the extract. One (R 150) was killed at the end of 12 days. While no evidence of heart disease or joint involvement was noted, alpha prime streptococci were grown from the heart blood. The other animal (R 149) at the end of 11 days became violently dyspnoeic and pain was elicited on palpation of the tarso-metatarsal and phalangeal joints of the left hind limb. This animal was killed. Necropsy revealed that the pericardium was distended with a clear, but flocculent, gelatinous fluid. The myocardium was filled with whitish areas, apparently of necrosis. The valves were negative. On the interventricular septum, and extending to the wall of the right ventricle, a large vegetation,

1.2 by 0.5 cm was implanted. Microscopic examination revealed an acute vegetative endocarditis with necrosis and leucocytic infiltration of the adjacent muscle. The epicardium revealed mesothelial swelling and more or less uniform infiltration with lymphocytes and monocytes. Cocci were abundant, particularly in the vegetation. The organisms were recovered from the heart blood and pericardial fluid.

Two cubic centimeters of the extract of cardiac tissues of R 149 were injected intravenously into three rabbits (R 158, R 159, R 160), all of which developed vegetations in the right ventricle, and one a pericardial condition similar to that described in the case of R 149. Alpha prime streptococci were obtained from the heart blood at necropsy of two of these animals (R 159 and R 160). Extracts of the cardiac tissues of these three animals were injected into other animals. The extracts from R 158 and R 160 failed to develop cardiac lesions. One of the animals (R 183) developed a joint lesion. Both of the animals (R 167 and R 168) injected with the extract of cardiac tissues from R 159 developed cardiac lesions in the right ventricle. In each instance the findings were those of acute vegetative and ulcerative endocarditis. The vegetations were quite large, nearly causing stenosis of the auriculo-ventricular orifice.

The extracts of cardiac tissues from R 167 were injected into two other rabbits (R 169 and R 170) and similar lesions were produced. The experiment was thus continued until the seventh passage, at which point it was discontinued. The lesions were similar to those described in the case of R 149, with the exception that toward the latter part of the experiment it was not possible to demonstrate organisms in the vegetations. Cultures of the heart bloods toward the latter part of the experiment were negative. The lesions were uniformly on the right side of the heart, either on the wall or inter-ventricular septum of the right ventricle, right auriculo-ventricular valve, or pulmonary conus.

Due to the rapidity with which the lesions were formed, it was considered likely that the condition may have been caused by the fibrin of the extract being deposited on the chordae tendinae of the right ventricle, with subsequent proliferation of organisms. Against this theory is the observation that in no single instance did pneumonia occur, nor was there evidence of pulmonary infarction. Five rabbits were intravenously injected with 2 cc of normal rabbit heart extract and three (none shown on the chart) with 2 cc of a mixture of normal rabbit heart extract to which alpha prime streptococci were added. The results in both instances were negative. The organisms used in this work were stock cultures obtained originally from this case, but may have been attenuated in the 6 months intervening between

the time these organisms were obtained and this part of the experiment was performed.

To rule out the possibility of a filterable virus, portions of the extracts from R 149 and R 169 were passed through Berkefeld filters and 2 cc of the filtrate injected intravenously into other rabbits. The results were negative.

Streptococcal cultures from the heart blood of R 149 were injected into two rabbits. One animal (R 163) showed no evidence of disease at necropsy at the end of 23 days; the other animal (R 164) after 12 days developed tenderness and swelling of the left elbow joint. It was killed at the end of 30 days and a creamy, purulent pus was found in the joint. The heart was negative. Alpha prime organisms were obtained from the pus. These organisms were injected into two other animals, one of which (R 188) died in a day. No lesions were found. The other (R 189) developed arthritis of the right wrist joint. On necropsy at the end of 6 weeks the heart was grossly normal. Microscopic examination revealed an occasional focus of pericapillary fibroblastic proliferation with endothelial swelling. In these areas a few lymphocytes were seen. In the muscle of the atrium an area of loose connective tissue proliferation interrupted the muscle fibers. The capillaries in this region were prominent and showed large proliferating fibroblasts in the surrounding tissue, as well as moderately dense infiltrations of lymphocytes and plasma cells. Only some of the cells could be classified as of giant size. The central vessel in the nodule showed endothelial swelling with partial obliteration. The interrupted fibers revealed perinuclear vacuolarization and increased acidophilia. The valve itself was not affected. These findings are regarded as those of a subacute focal myocarditis suggestive of the rheumatic type. Subsequently six other animals (R 240, R 241, R 242, R 243, R 244, R 245) were injected intravenously with 2 cubic centimeters of the R 164 culture. Two (R 243 and R 245) developed mucopurulent arthritis, but in none was there evidence of heart disease. In view of the inconstancy of the findings, little significance is attached to these lesions.

#### SUMMARY

Three monkeys were injected with fresh cultures of alpha prime streptococci from the patient. Two developed arthritis and one died of toxemia. No evidence of heart disease was found. One monkey injected with an extract of cardiac tissues developed an acute bacterial myocarditis. Thirteen rabbits were injected with streptococci from the original case or subsequent cases. Four developed arthritis and two myocarditis. Four rabbits were injected with extracts of the cardiac tissues passed through Berkefeld filters. None developed

disease. Twenty-six rabbits were injected with extracts of heart tissues from the patient or from animals having endocarditis. Two died instantly; 15 developed acute right ventricular endocarditis of bacterial origin; and 3 developed joint conditions.

#### DISCUSSION

The foregoing experiments are of interest, not because of the type of lesions produced, but in the constancy with which right-sided lesions were produced by the method used. There is no evidence that they are rheumatic or even represent a pathological entity, the animal equivalent of rheumatic fever in man. It would appear that streptococci have a tendency to lose virulence. It is not to be inferred that these organisms have any special affinity for the right side of the heart, since when injected by other methods, the organisms failed so to act. It is rather believed that the infection of the right side of the heart was due to the admixture of these organisms with particles in the heart tissue extracts. The failure of subsequent experiments was probably due to attenuation of these organisms.

#### CONCLUSIONS

1. Acute ulcerovegetative endocarditis of the right side of the heart was produced by intravenously injecting extracts of cardiac tissues obtained from infected sources. This was carried out for several passages.
2. Streptococci appear to be readily attenuated.
3. There is no evidence to suggest that the above-mentioned condition had any relationship to rheumatic heart disease.

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### LEAD POISONING IN A STORAGE BATTERY PLANT

A report has recently been issued by the Public Health Service on a study of the lead hazard in a storage battery plant.<sup>1</sup> The investigation included a plant survey, the determination of lead dust and fumes in the air, a record of employment and of disabling illness (especially compensation cases of plumbism), physical examinations, and blood and urine analyses.

*Environmental factors.*—In all, 68 samples of atmospheric lead dust or fumes were obtained with the impinger apparatus. The average in the various departments (account being taken of the proportion of time spent in each activity) was as follows: Mixing, 120 milligrams per 10 cubic meters of air; pasting, 60; burning, 5.7; foundry (except pit), 1.2; other departments, 2.0; outdoors, 1.1; first aid room, 0.20.

<sup>1</sup> Lead Poisoning in a Storage Battery Plant. By Albert E. Russell, Roy R. Jones, J. J. Bloomfield, Rollo H. Britten, and Lewis R. Thompson. Public Health Bulletin No. 205.

A study of the lead compounds used or formed in the various work-rooms showed that comparatively soluble forms of lead were present.

In addition to the hazard due to inhalation of dust and fumes, there was evidence of ingestion of lead dust through careless personal habits on the part of many employees.

*Physical examinations.*—The important subjective symptoms noted were colic, weakness, myalgia, nausea and vomiting, loss of appetite, constipation, nervousness and irritability, and bad taste in the mouth. The important objective findings were pallor, jaundice, tremor, reflex changes, and pathological changes in the blood and urine.

*Blood examinations.*—The average stipple count found in this study was about 300 per 100,000 red cells, the examinations being made on workers coming to the plant dispensary and presumably leaded. Although no reading on a control was 10 or more, 1,424 out of 1,575 readings on the exposed group (90 percent) were 10 or more. However, the wide fluctuation from count to count on the same person, the lack of any increase with additional absorption of lead, the widely different counts at the time individuals were placed on compensation for plumbism, and the lack of correlation between length of case and stipple count, all go to show that the actual number of stippled cells found cannot be taken as a measure of the amount of lead absorbed or of the effect on the worker. In spite of wide individual variation, there was a parallel increase in the number of stippled cells and of reticulocytes. The conclusion was reached that estimation of reticulocytes offered the most practicable method at the present time for the determination of early lead absorption.

A decrease in platelets was demonstrated as frequently associated with prolonged exposure to lead. The average count in 42 cases of moderately severe plumbism was 139,000 per cubic millimeter. The anemia was demonstrated to be a secondary type, with corresponding decreases in total red blood cells and hemoglobin.

*Urinalyses.*—If the presence of albumin, red blood cells, or granular casts be taken as indicative of irritation of the kidneys, the specimens from the group of leaded workers offered a marked contrast to the controls. Thirty-seven percent showed granular casts as against 7.5 percent of the controls.

*Compensation cases of plumbism.*—The incidence of plumbism sufficiently severe to receive compensation was extremely high—the annual rate for all workers being 15.9 per 100. The total number of compensation cases observed was 158. There was a close correlation between lead exposure in the different departments and the risk of developing a case of lead poisoning or of showing other evidence of lead absorption. In the mixing department (average concentration 120 milligrams per 10 cubic meters of air), there was an appreciable

risk even in the first month. The monthly plumbism rate then rose rapidly until it reached 44 per 100 (third to sixth month).

The importance of the lead hazard in this plant from an economic point of view was shown by the time spent on compensation, which, in the mixing department, rose to the level of 33 percent in the third month of exposure to lead. There was a great variability in the individual duration of compensation cases.

Except for prolonged exposure, it appears that the limit of safety under the conditions encountered in this study is an atmospheric concentration of lead dust or fumes of less than 1.5 milligrams per 10 cubic meters of air.

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### COURT DECISION RELATING TO PUBLIC HEALTH

*Ordinance prohibiting sale in city of ice manufactured outside of city, unless made with distilled water, held valid.*—(Texas Commission of Appeals, Sec. B; *City of El Paso et al. v. Jackson et al.*, 59 S. W. (2d) 822; decided May 3, 1933.) An ordinance of the city of El Paso provided as follows:

SEC. 1. It shall be unlawful for any person, firm, or corporation to sell or offer for sale or distribute in the city of El Paso any ice manufactured outside the city of El Paso except ice manufactured wholly with distilled water.

SEC. 2. Any person violating the foregoing ordinance shall be deemed guilty of a misdemeanor and shall be fined the sum of \$10 and each sale or offering for sale shall constitute a separate offense.

A suit was brought against the city and certain of its officials by persons engaged in selling ice in El Paso, which ice was manufactured from raw water in the city of Juarez, Mexico, and brought from Mexico in trucks and wagons. The trial court, being of the opinion that the ordinance was void because discriminatory and imposing a burden on interstate commerce, perpetually enjoined the city and certain of its officials from enforcing or threatening to enforce the ordinance. The trial court's judgment was affirmed by the court of civil appeals and the city and the other defendants appealed.

It appeared that the city of El Paso had no way of enforcing periodic and proper inspection of the water in Juarez from which ice was manufactured, while within El Paso the water from which ice was made was tested as to its purity by the city health department. The commission of appeals took the view that the matter had been settled adversely to the defendants in error by the decision of the United States Supreme Court in *Adams v. City of Milwaukee*, 228 U.S. 572, 33 S.Ct. 610, 57 L.Ed. 971. In that case there was involved the validity of an ordinance of the city of Milwaukee, which prohibited bringing into the city or selling or offering for sale therein milk or cream drawn from cows outside of said city unless (among other requirements)

the owner of such cows had filed in the office of the health commissioner a certificate that such cows had been tested with tuberculin and found free from tuberculosis or other contagious diseases. It was contended that the ordinance was unconstitutional in that it was partial and unequal in its operation as it applied to dealers in milk drawn from cows outside the city, while dealers in milk drawn from cows within the city were not included in its terms or subject to its requirements. The supreme court of Wisconsin, the judgment of which court was affirmed by the United States Supreme Court, held that the differences in the situation of the milk producing animals and in the facilities for inspection and investigation were sufficient to authorize the common council to legislate with reference to milk shipped into the city and make police regulations applying to dealers in and shippers of such milk separate from and different from the regulations applying to cows within the city. Comparing the Adams case with the instant case, the commission of appeals stated:

We see no difference in principle between that case [the *Adams case*] and the one under consideration. In the one case, foreign cows producing the milk must be injected with tuberculin; in the other, water out of which foreign ice is produced must be distilled.

\* \* \* \* \*

There, as here, the petitioner claimed that the most the city could do was to require the milk to be pure and wholesome, but the supreme court said the city had the right to require an injection into those cows outside the city as a measure of assurance of its purity, just as here the city requires the injection of heat to the water to assure its purity.

The conclusion of the commission of appeals was that the ordinance of El Paso was valid. The judgments of the trial court and of the court of civil appeals were both reversed and judgment was rendered for the plaintiffs in error.

## DEATHS DURING WEEK ENDED AUGUST 5, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Aug. 5, 1933	Correspond- ing week 1932
<b>Data from 85 large cities of the United States:</b>		
Total deaths.....	7, 532	6, 253
Deaths per 1,000 population, annual basis.....	10. 6	8. 9
Deaths under 1 year of age.....	550	513
Deaths under 1 year of age per 1,000 estimated live births (81 cities).....	46	42
Deaths per 1,000 population, annual basis, first 31 weeks of year.....	11. 3	11. 6
<b>Data from industrial insurance companies:</b>		
Policies in force.....	67, 678, 825	71, 503, 898
Number of death claims.....	11, 185	11, 858
Death claims per 1,000 policies in force, annual rate.....	8. 6	8. 7
Death claims per 1,000 policies, first 31 weeks of year, annual rate.....	10. 2	10. 0

# PREVALENCE OF DISEASE

*No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring*

## UNITED STATES

### CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Aug. 12, 1933, and Aug. 13, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Aug. 12, 1933, and Aug. 13, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932
<b>New England States:</b>								
Maine.....					4	9	0	0
New Hampshire.....					3	3	0	0
Vermont.....		2			8	12	0	0
Massachusetts.....	15	29		1	77	71	1	0
Rhode Island.....					2		0	0
Connecticut.....	2	4	3		10	14	0	1
<b>Middle Atlantic States:</b>								
New York.....	26	54	14	11	204	176	7	4
New Jersey.....	5	16		3	28	70	1	0
Pennsylvania.....	40	29			116	72	4	5
<b>East North Central States:</b>								
Ohio.....	24	31	21	10	15	55	3	2
Indiana.....	11	27	18	16	4	2	4	3
Illinois.....	9	34	3	4	18	34	6	7
Michigan.....	20	17			28	168	0	0
Wisconsin.....	4	6	22	13	38	35	1	0
<b>West North Central States:</b>								
Minnesota.....	5	7	1	1	11	8	0	1
Iowa <sup>2</sup> .....	9	6				1	1	0
Missouri.....	12	15		2	12	3	1	1
North Dakota.....		7			18		0	0
South Dakota.....	3	2	4			1	0	0
Nebraska.....		3			6	3	0	1
Kansas.....	7	10	2	1	11	9	0	1
<b>South Atlantic States:</b>								
Delaware.....	1					1	2	0
Maryland <sup>2,3</sup> .....	4	6	1	1	2	4	0	0
District of Columbia <sup>2</sup> .....	8	3		1	10	1	0	0
Virginia <sup>4</sup> .....	13	22			31	17	0	1
West Virginia.....	23	11	8	61	14	14	1	1
North Carolina <sup>2</sup> .....	23	15		20	34	31	1	1
South Carolina <sup>4</sup> .....	5	6	61	88	34	7	0	0
Georgia <sup>4</sup> .....	23	11		5	36		3	2
Florida.....	6	14		4	24		0	0
<b>East South Central States:</b>								
Kentucky.....	18	25					3	2
Tennessee <sup>3,4</sup> .....	11	9	3	6	21	5	2	1
Alabama <sup>4</sup> .....	27	23	11	1	6		1	0
Mississippi.....	13	21					0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Aug. 12, 1933, and Aug. 13 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932
<b>West South Central States:</b>								
Arkansas.....	3	5		2	42		0	0
Louisiana.....	13	17	2	10	2	11	0	0
Oklahoma <sup>1</sup> .....	8	22		16	2		1	0
Texas <sup>4</sup> .....	54	53	15	22	82	7	0	0
<b>Mountain States:</b>								
Montana.....	1			4	2	15	0	0
Idaho.....					3		0	0
Wyoming.....		1			4	4	0	0
Colorado.....	3	7			2	2	1	0
New Mexico.....		22		2		1	0	1
Arizona.....	3		1		2	6	0	0
Utah <sup>2</sup> .....			1		18		0	0
<b>Pacific States:</b>								
Washington.....		1		1	15	3	0	0
Oregon.....	1		9	4	16	10	0	0
California.....	16	24	13	53	97	34	2	2
<b>Total.....</b>	<b>469</b>	<b>622</b>	<b>206</b>	<b>353</b>	<b>1,112</b>	<b>919</b>	<b>46</b>	<b>37</b>

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932
<b>New England States:</b>								
Maine.....	2	3	4	16	0	0	4	4
New Hampshire.....	0	0	7	5	0	0	0	2
Vermont.....	1	0	7	4	0	0	0	0
Massachusetts.....	29	2	50	80	0	0	2	7
Rhode Island.....	1	0	4	5	0	0	1	0
Connecticut.....	2	0	12	11	0	0	3	4
<b>Middle Atlantic States:</b>								
New York.....	100	17	85	120	0	0	64	59
New Jersey.....	9	15	14	27	0	0	4	14
Pennsylvania.....	27	71	113	68	0	0	49	38
<b>East North Central States:</b>								
Ohio.....	15	7	122	111	1	3	52	64
Indiana.....	0	0	22	13	0	3	32	26
Illinois.....	6	6	92	94	1	1	30	79
Michigan.....	2	3	64	74	1	0	8	15
Wisconsin.....	2	1	9	6	10	0	3	4
<b>West North Central States:</b>								
Minnesota.....	11	5	15	21	1	0	0	1
Iowa <sup>1</sup> .....	2	3	13	7	1	2	1	3
Missouri.....	2	1	11	13	0	2	20	20
North Dakota.....	6	0	5	1	0	5	0	4
South Dakota.....	3	0	2	0	0	0	7	0
Nebraska.....	0	1	3	6	0	1	2	3
Kansas.....	2	0	23	11	0	4	8	21
<b>South Atlantic States:</b>								
Delaware.....	0	0	3	2	0	0	4	2
Maryland <sup>2</sup> .....	1	2	27	15	0	0	19	46
District of Columbia <sup>3</sup> .....	0	0	5	6	0	0	0	3
Virginia <sup>4</sup> .....	2	1	25	37	0	0	50	64
West Virginia.....	4	2	17	6	6	0	61	46
North Carolina <sup>5</sup> .....	0	2	36	27	0	0	24	44
South Carolina <sup>4</sup> .....	1	1	1	3	0	0	34	56
Georgia <sup>4</sup> .....	0	0	7	2	0	0	48	55
Florida.....	0	0	1	0	0	0	7	4
<b>East South Central States:</b>								
Kentucky.....	2	1	49	7	0	3	120	130
Tennessee <sup>3</sup> .....	5	4	33	31	0	0	73	132
Alabama <sup>4</sup> .....	1	0	16	14	0	0	31	31
Mississippi.....	0	0	5	5	9	1	24	36
<b>West South Central States:</b>								
Arkansas.....	0	1	1	1	0	0	25	26
Louisiana.....	0	3	9	6	6	2	55	31
Oklahoma <sup>5</sup> .....	0	2	3	15	0	0	27	74
Texas <sup>4</sup> .....	5	0	18	23	5	4	98	47

See footnotes at end of table.

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Aug. 12, 1933, and Aug. 13, 1932—Continued*

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932
<b>Mountain States:</b>								
Montana.....	0	0	5	12	0	8	3	3
Idaho.....	1	0	1	-----	1	0	3	2
Wyoming.....	0	0	1	-----	0	0	0	0
Colorado.....	0	1	7	5	2	0	4	3
New Mexico.....	0	0	4	3	0	0	8	15
Arizona.....	0	1	7	2	0	0	5	0
Utah <sup>1</sup> .....	0	0	1	2	0	0	2	0
<b>Pacific States:</b>								
Washington.....	0	1	5	14	1	4	3	7
Oregon.....	2	0	10	4	4	0	0	2
California.....	3	5	49	40	14	13	9	16
<b>Total.....</b>	<b>249</b>	<b>162</b>	<b>1,022</b>	<b>976</b>	<b>63</b>	<b>56</b>	<b>1,032</b>	<b>1,243</b>

<sup>1</sup> New York City only.

<sup>2</sup> Week ended earlier than Saturday.

<sup>3</sup> Rocky Mountain spotted fever, week ended Aug. 12, 1933, 6 cases, as follows: Maryland, 2; District of Columbia, 1; North Carolina, 2; Tennessee, 1.

<sup>4</sup> Typhus fever, week ended Aug. 12, 1933, 58 cases, as follows: Virginia, 1; South Carolina, 2; Georgia, 18; Tennessee, 1; Alabama, 23; Texas, 8.

<sup>5</sup> Exclusive of Oklahoma City and Tulsa.

### SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week.

State	Menin- gococ- cus menin- gitis	Diph- theria	Influ- enza	Malaria	Measles	Pel- lagra	Polio- mye- litis	Scarlet fever	Small- pox	Ty- phoid fever
<b>June 1933</b>										
Mississippi.....	4	10	443	4,838	588	1,142	1	23	4	96
<b>July 1933</b>										
Arizona.....	1	11	2	1	57	-----	0	15	1	21
Florida.....	1	13	2	48	107	6	2	3	0	10
Indiana.....	8	46	49	4	84	-----	1	81	1	59
Maine.....	1	3	8	-----	14	-----	1	20	0	12
Michigan.....	-----	109	7	5	434	-----	6	429	5	25
Missouri.....	13	112	4	59	295	-----	7	78	8	84
New Mexico.....	1	15	1	13	44	2	0	6	4	14
Tennessee.....	5	39	40	486	332	75	25	51	0	405
Texas.....	12	230	261	-----	722	71	7	151	70	325
Vermont.....	-----	2	-----	-----	88	-----	0	16	0	2

<b>June 1933</b>		<b>Cases</b>	<b>Chicken pox:</b>	<b>Cases</b>	<b>Dysentery:</b>	<b>Cases</b>
Mississippi:			Arizona.....	14	Arizona.....	8
Chicken pox.....	251		Indiana.....	24	Florida.....	4
Dengue.....	20		Maine.....	82	Missouri.....	4
Dysentery (amebic).....	121		Michigan.....	207	Tennessee.....	107
Hookworm disease.....	337		Missouri.....	31	Texas.....	248
Mumps.....	126		New Mexico.....	6	German measles:	
Puerperal septicemia.....	20		Tennessee.....	13	Maine.....	12
Trachoma.....	6		Texas.....	107	Michigan.....	132
Whooping cough.....	1,388		Vermont.....	30	Tennessee.....	53
			Conjunctivitis:		Impetigo contagiosa:	
			New Mexico.....	4	Tennessee.....	7
			Dengue:		Lethargic encephalitis:	
<b>July 1933</b>			Florida.....	1	Michigan.....	1
Anthrax:			Texas.....	7	Tennessee.....	4
Indiana.....	1				Texas.....	1
Texas.....	3					

Mumps:		Cases	Rabies in animals:		Cases	Undulant fever:		Cases
Arizona	-----	10	Indiana	-----	40	Arizona	-----	2
Florida	-----	15	Maine	-----	1	Florida	-----	2
Indiana	-----	7	Missouri	-----	10	Indiana	-----	1
Maine	-----	11	Texas	-----	4	Michigan	-----	9
Michigan	-----	163	Scabies:			New Mexico	-----	2
Missouri	-----	60	Tennessee	-----	2	Texas	-----	6
New Mexico	-----	19	Septic sore throat:			Vermont	-----	1
Tennessee	-----	24	Michigan	-----	14	Vincent's angina:		
Texas	-----	96	Missouri	-----	7	Maine	-----	1
Vermont	-----	87	Tennessee	-----	2	Michigan	-----	53
Ophthalmia neonatorum:			Texas	-----	4	Tennessee	-----	1
Tennessee	-----	1	Tetanus:			Whooping cough:		
Texas	-----	3	Missouri	-----	1	Arizona	-----	25
Paratyphoid fever:			Tennessee	-----	4	Florida	-----	23
Florida	-----	1	Texas	-----	3	Indiana	-----	203
Indiana	-----	2	Trachoma:			Maine	-----	26
Maine	-----	1	Arizona	-----	13	Michigan	-----	1,263
Tennessee	-----	3	Tennessee	-----	35	Missouri	-----	178
Texas	-----	17	Texas	-----	10	New Mexico	-----	71
Puerperal septicaemia:			Tularaemia:			Tennessee	-----	230
New Mexico	-----	2	Tennessee	-----	1	Texas	-----	736
Tennessee	-----	1	Texas	-----	6	Vermont	-----	96
			Typhus fever:					
			Florida	-----	11			
			Texas	-----	90			

**LETHARGIC ENCEPHALITIS, ST. LOUIS, MO.**

From July 31 to August 22, 1933, 123 cases of lethargic encephalitis, with 13 deaths, were reported in St. Louis County, Mo., and 28 additional cases with 3 deaths were reported in the city of St. Louis.

**PLAGUE IN CALIFORNIA**

A case of human plague has been reported at Whittier, Los Angeles County, Calif., onset July 31, death occurring August 9, 1933.

Under date of August 15, 1933, 2 plague-infected ground squirrels were reported found in a lot of 37 squirrels shot on the Joe Serpa Ranch, 13 miles southeast of Tres Pinos, San Benito County, Calif. The squirrels were received at the State bacteriological laboratory August 5, 1933.

**WEEKLY REPORTS FROM CITIES**

*City reports for week ended Aug. 5, 1933*

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Small-pox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
<b>Maine:</b>											
Portland	0	-----	0	1	0	0	0	0	0	0	17
<b>New Hampshire:</b>											
Concord	0	-----	0	0	0	0	0	1	0	0	0
Nashua	0	-----	0	0	0	0	0	0	0	5	0
<b>Vermont:</b>											
Barre	0	-----	0	7	0	0	0	0	0	0	1
Burlington	0	-----	0	0	0	0	0	0	0	1	7
<b>Massachusetts:</b>											
Boston	5	-----	0	29	17	14	0	7	1	71	170
Fall River	0	-----	0	1	1	3	0	2	1	5	30
Springfield	0	-----	0	0	0	0	0	0	2	4	32
Worcester	0	-----	0	15	2	3	0	2	0	6	46
<b>Rhode Island:</b>											
Pawtucket	0	-----	0	0	0	0	0	0	0	0	16
Providence	1	-----	0	0	1	8	0	2	0	27	54
<b>Connecticut:</b>											
Bridgeport	0	-----	0	7	1	2	0	0	0	0	24
Hartford	0	-----	0	0	2	7	0	1	0	0	39
New Haven	1	-----	0	2	1	1	0	0	0	5	20

## City reports for week ended Aug. 5, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
<b>New York:</b>											
Buffalo.....	2		0	9	10	3	0	5	0	35	107
New York.....	22	1	2	49	99	22	0	90	29	144	1,569
Rochester.....	0		0	0	3	2	0	1	1	10	67
Syracuse.....	0		0	0	2	0		1	0	16	44
<b>New Jersey:</b>											
Camden.....	0		0	0	1	1	0	1	1	0	26
Newark.....	0		0	3	4	4	0	3	1	39	80
Trenton.....	0		0	2	1	0	0	1	2	3	41
<b>Pennsylvania:</b>											
Philadelphia.....	0	1	0	36	10	18	0	24	3	19	450
Pittsburgh.....	9		0	2	7	17	0	6	3	118	140
Reading.....	4		0	2	1	0	0	1	0	13	29
<b>Ohio:</b>											
Cincinnati.....	0		2	4	5	4	0	13	0	27	153
Cleveland.....	5	13	0	1	7	7	0	10	3	54	174
Columbus.....	0		0	0	3	7	0	1	2	6	77
Toledo.....	1	1	0	1	1	14	0	3	0	14	52
<b>Indiana:</b>											
Fort Wayne.....	1		0	0	2	1	0	0	0	2	21
Indianapolis.....	0		0	4	5	2	0	1	1	6	-----
South Bend.....	0		0	0	0	2	0	1	0	0	11
Terre Haute.....	0		0	1	0	0	0	0	0	3	9
<b>Illinois:</b>											
Chicago.....	1	2	1	15	28	44	0	47	2	102	610
Springfield.....	1		0	1	2	1	0	0	0	1	20
<b>Michigan:</b>											
Detroit.....	8	1	0	0	5	15	0	17	2	99	240
Flint.....	0		0	0	0	1	0	1	1	5	22
Grand Rapids.....	0		0	0	1	2	0	1	0	26	22
<b>Wisconsin:</b>											
Keosha.....	0		0	5	3	0	0	0	0	10	7
Milwaukee.....	1		0	0	3	3	0	4	0	214	84
Racine.....	0		0	0	0	2	0	1	0	53	6
Superior.....	0		0	0	0	0	0	0	0	17	5
<b>Minnesota:</b>											
Duluth.....	0		0	1	0	1	0	0	0	13	16
Minneapolis.....	0		0	1	2	3	0	1	1	2	98
St. Paul.....	0		0	0	3	0	0	2	1	35	52
<b>Iowa:</b>											
Davenport.....	0		0	0	0	0	0	0	0	0	-----
Des Moines.....	2		0	0	0	5	0	0	0	0	18
Sioux City.....	2		0	0	0	0	0	0	0	2	-----
<b>Missouri:</b>											
Kansas City.....	1		0	1	5	2	0	4	3	7	73
St. Joseph.....	0		1	0	2	0	0	0	0	0	25
St. Louis.....	2		0	10	2	4	0	15	7	18	193
<b>North Dakota:</b>											
Fargo.....	1		0	1	0	0	0	0	0	0	10
Grand Forks.....	0		0	1	0	0	0	0	0	0	0
<b>South Dakota:</b>											
Aberdeen.....	0		0	0	0	0	0	0	0	2	0
<b>Nebraska:</b>											
Omaha.....	0		1	3	5	1	0	0	0	16	51
<b>Kansas:</b>											
Topeka.....	0		0	1	0	1	0	0	0	0	-----
Wichita.....	0		0	0	0	1	0	0	0	14	23
<b>Delaware:</b>											
Wilmington.....	0		0	0	0	0	0	1	0	4	42
<b>Maryland:</b>											
Baltimore.....	0		0	0	11	10	0	11	5	76	231
Frederick.....	0		0	0	0	0	0	0	0	0	3
<b>District of Col.:</b>											
Washington.....	8	0	0	2	7	7	0	13	2	12	156
<b>Virginia:</b>											
Lynchburg.....	0		0	4	0	0	0	0	0	19	11
Norfolk.....	0		0	0	3	0	0	2	1	0	34
Richmond.....	0		0	0	1	1	0	1	0	0	55
Roanoke.....	0		0	0	0	1	0	0	0	0	14
<b>West Virginia:</b>											
Charleston.....	0		0	0	2	0	0	2	2	2	19
Huntington.....	0		0	0	0	2	0	0	0	0	0
Wheeling.....	0		0	0	0	0	0	0	14	3	16
<b>North Carolina:</b>											
Raleigh.....	0		0	0	0	1	0	0	0	2	18
Wilmington.....	0		0	0	0	1	0	1	1	0	12
Winston-Salem.....	7	1	0	2	1	3	0	1	0	2	15

1 Two nonresidents.

City reports for week ended Aug. 5, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Small-pox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
<b>South Carolina:</b>											
Charleston.....	0		1	0	1	0	0	1	4	0	25
Columbia.....	0		0	0	0	0	0	0	0	0	0
Greenville.....	0		0	0	1		0	0	0	0	9
<b>Georgia:</b>											
Atlanta.....	7	3	0	1	3	2	0	4	1	6	0
Brunswick.....	0		0	0	1	0	0	0	0	0	4
<b>Florida:</b>											
Miami.....	0		0	0	2	0	0	0	0	2	24
Tampa.....	1		0	0	1	0	0	0	0	0	25
<b>Kentucky:</b>											
Ashland.....	0		0	0	0	0	0	0	2	0	0
Lexington.....	0		0	0	0	0	0	1	8	0	22
Louisville.....	0	1	0	0	3	1	0	2	3	6	63
<b>Tennessee:</b>											
Memphis.....	1		0	11	1	2	0	7	8	9	90
Nashville.....	0		0	2	0	3	0	0	8	9	47
<b>Alabama:</b>											
Birmingham.....	3		1	0	4	1	0	7	7	4	68
Mobile.....	0		0	0	0	1	0	0	0	0	28
Montgomery.....	0	1		0		0	0	0	0	5	
<b>Arkansas:</b>											
Fort Smith.....	0			0		1	0		0	0	
Little Rock.....	0		0	0	2	0	0	3	1	0	6
<b>Louisiana:</b>											
New Orleans.....	5	1	1	0	9	5	0	14	7	1	156
Shreveport.....	0		0	0	4	0	0	3	0	0	
<b>Oklahoma:</b>											
Tulsa.....	0			1		1	0		0	6	
<b>Texas:</b>											
Dallas.....	2		0	0	0	0	0	1	4	10	51
Fort Worth.....	2		0	0	0	0	0	1	1	0	27
Galveston.....	0		0	0	0	0	0	0	0	0	8
Houston.....	3		1	2	4	0	0	4	1	0	81
San Antonio.....	0		1	1	2	0	0	2	0	0	49
<b>Montana:</b>											
Billings.....	0		0	0	0	0	0	0	0	0	6
Great Falls.....	0		0	0	0	1	0	0	0	10	3
Helena.....	0		0	0	0	0	0	0	0	0	3
Missoula.....	0		0	0	0	0	0	0	0	0	6
<b>Colorado:</b>											
Denver.....	0		0	3	3	2	0	5	0	16	77
Pueblo.....	0		0	0	0	0	0	1	1	5	10
<b>New Mexico:</b>											
Albuquerque.....	0		0	0	0	0	0	2	0	6	13
<b>Utah:</b>											
Salt Lake City.....	0		1	14	0	2	0	1	2	15	24
<b>Nevada:</b>											
Reno.....	0		0	0	0	0	0	0	0	0	8
<b>Washington:</b>											
Seattle.....	0		1	1	2	5	1	4	2	21	75
Spokane.....				6				1			20
Tacoma.....	0		0	0	2	0	0	0	0	5	21
<b>Oregon:</b>											
Portland.....	0		0	2	3	4	3	1	0	1	55
Salem.....	0		0	0	0	1	0	0	0	0	0
<b>California:</b>											
Los Angeles.....	7	5	1	22	9	11	13	20	0	72	218
Sacramento.....	0		0	0	0	0	0	4	1	5	30
San Francisco.....	3		1	2	2	4	0	6	0	10	110

\* Nonresident.

## City reports for week ended Aug. 5, 1933—Continued

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
<b>Massachusetts:</b>				<b>Missouri:</b>			
Boston.....	0	1	12	St. Louis.....	0	0	1
Worcester.....	0	0	3	<b>North Dakota:</b>			
<b>New York:</b>				Fargo.....	0	0	1
New York.....	1	1	60	<b>District of Columbia:</b>			
<b>New Jersey:</b>				Washington.....	1	0	0
Camden.....	0	0	1	<b>South Carolina:</b>			
Newark.....	0	0	1	Greenville.....	0	1	0
<b>Pennsylvania:</b>				<b>Georgia:</b>			
Philadelphia.....	0	0	2	Atlanta.....	0	0	1
Pittsburgh.....	0	0	8	<b>Tennessee:</b>			
<b>Ohio:</b>				Nashville.....	0	0	1
Cleveland.....	0	0	1	<b>Louisiana:</b>			
<b>Indiana:</b>				New Orleans.....	0	0	2
Indianapolis.....	2	0	0	<b>Texas:</b>			
<b>Illinois:</b>				Houston.....	0	0	1
Chicago.....	4	0	4	<b>Oregon:</b>			
<b>Michigan:</b>				Portland.....	0	0	1
Detroit.....	0	0	1	<b>California:</b>			
<b>Minnesota:</b>				Los Angeles.....	0	0	1
Duluth.....	1	0	1	Sacramento.....	0	0	1
<b>Iowa:</b>							
Des Moines.....	1	0	0				
Sioux City.....	2	0	1				

*Lethargic encephalitis*.—Cases: Hartford, 1; Newark, 1; Cleveland, 1; Detroit, 1.

*Pellagra*.—Cases: Charleston, S. C., 1; Montgomery, 1; New Orleans, 2.

*Typhus fever*.—Cases: New York, 1; Norfolk, 2; Wilmington, N. C., 2; Charleston, S. C., 1; New Orleans, 1; Tampa, 1.

## FOREIGN AND INSULAR

### DENMARK

*Communicable diseases—April–June 1933.*—During the months of April, May, and June, 1933, cases of certain communicable diseases were reported in Denmark as follows:

Disease	Cases		
	April	May	June
Cerebrospinal meningitis.....	6	10	4
Chicken pox.....	45	50	30
Diphtheria and croup.....	148	118	116
Dysentery (amebic).....		1	
Erysipelas.....	208	209	207
German measles.....	37	103	73
Gonorrhoea.....	690	741	862
Influenza.....	5,526	3,379	2,043
Lethargic encephalitis.....	7	6	4
Measles.....	1,435	1,223	720
Mumps.....	622	696	511
Paratyphoid fever.....	12	13	15
Poliomyelitis.....	1		
Puerperal fever.....	14	12	18
Scabies.....	628	494	413
Scarlet fever.....	137	176	217
Syphilis.....	64	59	79
Tetanus.....	1	4	4
Typhoid fever.....	1	2	4
Undulant fever (Bact. abort Bang).....	55	59	57
Whooping cough.....	1,034	1,275	1,080

### ITALY

*Communicable diseases—4 weeks ended April 2, 1933.*—During the 4 weeks ended April 2, 1933, cases of certain communicable diseases were reported in Italy as follows:

Disease	Mar. 6-12		Mar. 13-19		Mar. 20-26		Mar. 27-Apr. 2	
	Cases	Com- munes affected	Cases	Com- munes affected	Cases	Com- munes affected	Cases	Com- munes affected
Anthrax.....	8	8	9	9	13	12	11	9
Cerebrospinal meningitis.....	14	13	17	11	9	8	19	16
Chicken pox.....	302	102	472	133	270	81	350	102
Diphtheria and croup.....	517	300	631	365	465	263	545	321
Dysentery.....	4	4			4	4	3	2
Lethargic encephalitis.....	2	2	1	1	2	2	3	3
Measles.....	1,227	219	1,471	240	1,133	215	1,692	251
Poliomyelitis.....	4	4	6	6	8	7	7	7
Scarlet fever.....	295	105	338	125	288	115	357	124
Typhoid fever.....	162	100	218	129	165	103	211	143

## JAMAICA

*Communicable diseases—4 weeks ended April 22, 1933.*—During the 4 weeks ended April 22, 1933, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island of Jamaica, outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox.....	6	19	Leprosy.....	1	3
Diphtheria.....		4	Puerperal fever.....		1
Dysentery.....	16	12	Tuberculosis.....	30	64
Erysipelas.....		3	Typhoid fever.....	18	60









**CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued**

**PLAGUE—Continued**

[C indicates cases; D, deaths; P, present]

Place	Janu- ary 1933	Febru- ary 1933	March 1933	April 1933	May 1933	June 1933	Place	Janu- ary 1933	Febru- ary 1933	March 1933	April 1933	May 1933	June 1933
British East Africa (see also table above): Kenya.....	6	11	3	6	4	6	Madagascar—Continued	75	8	9			
Ecuador.....	1		3		35		Miarinarivo.....	14	8	9			
Indo-China (see also table above):							Moramanga.....	163	23	48			
Cochin-China.....	2	3	7	6	3	5	Tamatave.....	159	23	46			
Cochin-China.....	1	1	2	5	2		Tananarive.....			1			
Madagascar:							Tananarive.....	195	210	175			
Province:	153	161	155				Peru.....	190	207	168			
Ambositra.....	146	149	154				Dakar <sup>1</sup> .....	4	18	7	2	3	
Antsirabe.....	63	72	63				Tivouane <sup>1</sup> .....	2	4	1	1	2	
Fianarantsoa.....	61	72	62					2	4	1	1	1	
Fianarantsoa.....		46	64										
Maevatanana.....		42	63										
	2	6	8										
	2	6	7										1

<sup>1</sup> Reports incomplete.

SMALLPOX

[C indicates cases; D, deaths; F, present]

Place	Week ended—													
	May 1933				June 1933				July 1933					
	6	13	20	27	3	10	17	24	1	8	15	22	29	
Algeria:														
Algiers Department.....														
Constantine Department.....														
Arabic:														
Aden.....		1												
Muscat—Oman Sultanate.....														
Argentina: Chaco Territory.....														
Belgian Congo.....														
Bolivia.....														
Brazil: Porto Alegre (alastrim).....														
British East Africa:														
Kenya.....		14	23	13	4									
Tanganyika.....		56	43	17										
British South Africa:														
Northern Rhodesia.....		1	21											
Southern Rhodesia.....		22												
Canada:														
British Columbia.....														
Ontario.....			5	11										
Toronto.....			13	11										
Saskatchewan.....		31	14	12										
Ceylon:														
Galle.....		75	34	4	2	4								
China:														
Amoy.....		5	4	3										
Canton.....		504	234	67	50	2	1	1						
Chemulpo.....		13	17	2										
Dairen.....														
Foochow.....		4	6	1										
Hangchow.....		P	P	P										
Hong Kong.....		78	169	84	6	8	3	2	3	2	2	1	1	

1 For 2 weeks.



Bombay	805	1,522	1,175	510	60	52	44	47	34	18	20	16	14	8	5	2
Calcutta	391	795	1,717	286	55	35	26	30	22	14	12	10	10	4	4	2
Chittagong	961	1,637	1,850	921	118	82	81	61	63	33	25	21	20	13	6	7
	672	1,147	1,063	745	97	72	74	46	45	23	19	20	10	8	3	7
Cochin			4	5			1			1			1			
Karachi	45	47	115	130	11	13	18	10	4	10	3	2	3	4	4	3
Madras	351	564	668	498	66	67	60	38	36	29	31	45	61	39	71	
Moulmein										12						
Nagapatam	3	2	4	6	4		1	2	1	1	1		4	1	2	
Rangoon	5	20	11	15	1	6	2	8	3	1	2		2	13	1	
Tuticorin				10												
Viragapatam			4	4	1		1		1	1	1	2	2	4	1	1
Indo-China (see also table below): Saigon and Cholon		3	7	2												
Iraq:																
Baghdad	8	4	2	2	3		1	1								
Basra	6	3	2		5		1		2							
Ireland: Belfast		1														
Japan:																
Kobe			5													
Nagoya													1			
Osaka	1			8												
Tokyo	3	4	2	6				1	1		1		27	11		
Yokohama			4	3		1										
Mexico:																
Coahuila																
Juarez	1							1	1			1				
Mexico, D.F.	3			6				2	2							
Monterrey	10	6	6	11		2	1	2	2	2	3			1		
Saltillo								2								
San Luis Potosi	4	4	3	1		1					2	1				
Morocco. (See table below.)				1	2	1		2			1		1	2	2	2
Nigeria								164								
Palestine	401	1,878	562	1,261	5									9	4	
Peru:									15	16						
Palatine	108	29	26	54	22	30	37		45	17						
Peru. (See table below.)	41	4	4	23	5	21	36									
Portugal:																
Lisbon					1		1					1				1
Oporto	4	4	2	2												
Siam: Bangkok	5	5	2			1		1		1	2		1	2		2
Sierra Leone	2	2	4													
Sudan (Anglo-Egyptian)	217	36	63	22		18		33		6						
Syria:																
Beirut	57	34	32	18	3			2	1					1	3	1
Provinces:	8	15	16	2	1					5	1		1	1	7	3
	66	34	25	40	7	7	2	4		1		3	6		3	2





**CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued**

**TYPHUS FEVER**

[C indicates cases; D, deaths; P, present]

Place	Jan. 8- Feb. 1933	Feb. 4- Mar. 1933	Mar. 1- Apr. 1933	Week ended—													
				April 1933				May 1933				June 1933				July 1933	
				8	15	22	29	6	13	20	27	3	10	17	24	1	8
Algeria:																	
Algiers Department.....	C	1	3														
Constantine Department.....	C	6	71	107	1	7	2	2	3	4		7	1			1	2
Bone.....	C		1	85	3	62	41	16	11	40	34	38	45	18	20	3	14
Oran Department.....	C		2	3	1	1											
Argentina: Buenos Aires.....	C	6															
Rasutoland. (See table below.)	C																
Bolivia. (See table below.)	C	17	19	12			2	8		2	2	1	2	1			1
British East Africa: Uganda.....	C	2	9	48			8										
Bulgaria.....	C	152	133	102	9												
Chile.....	C	1	1		33	37											
Antofagasta.....	C				1												
Santiago.....	C																
Valparaiso.....	C						34	30	29	41	33	85	74				1
China:																	
Hankow.....	C	3	5														
Nanking.....	C																
Shanghai.....	C																
Tientsin.....	C																
Czechoslovakia. (See table below.)																	
Egypt:																	
Alexandria.....	C	1															
Behira.....	C	128	171	184	74	175	6	7	4	7	5	4	3	9	2	3	1
Cairo.....	C		3	4		61	133	146	131	120	228	111	138	94	42		
Dakhliya.....	C	35	84	196	80	28	19	12	14	15	12	9	12	7	1	3	2
Damietta.....	C						76	47	49	71	86	61	47	24	46	23	43
Gharbiya.....	C	111	190	378	62	64	99	116	96	118	105	129	185	133	141	97	2
Provinces.....	C	320	492	922	273	292	332	348	388	446	402	375	568	341	381	242	199
Greece. (See table below.)																	
Guatemala. (See table below.)																	
Hungary.....	C	3	26	5	3												
Iraq: Baghdad.....	C																
Ireland: Belfast.....	C																
Lithuania.....	C	49	44	35	5	6	8	8	12	7	4	8	1	5	8	1	



**CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued**  
**YELLOW FEVER**

[C indicates cases; D, deaths; P, present]

Place	Jan. 3- Feb. 4, 1933	Feb. 5- Mar. 4, 1933	Mar. 5- Apr. 1, 1933	Apr. 2- Apr. 29, 1933	Week ended—													
					May 1933			June 1933										
					6	13	20	27	3	10	17	24	July 1933					
Brazil:																		
Ceara State:																		
Araripe.....		2																
Limoeiro.....		2		1														
Pernambuco State. <sup>1</sup>																		
French West Africa: Guinea.....																		
Gold Coast.....		1																
Guinea (Portuguese): Bissagos Islands.....		2																
Ivory Coast:		44																
Bouafle.....		14																
Gagnoa.....																		
Senegal:																		
Bakel.....																		
Dagana.....																		
Podor.....																		
St. Louis.....																		

<sup>1</sup> 1 case of yellow fever with 1 death was reported in Pernambuco State, Brazil, during June 1933.

<sup>2</sup> Suspected.

<sup>3</sup> Imported case.